and milk products in the State as a result of which people have to lean more heavily on fish and tapioca.

1.36 Among the items of non-food expenditure the significant point is the higher percentage of expenditure devoted to clothing. The neatness and cleanliness of dress worn by the people of Kerala is evident even to a casual visitor to the State.

The Food Gap

1.37 The superior cropping pattern has also brought with it a huge food deficit. In this, Kerala leads all the other States. The current production of foodgrains is estimated at 9.6 lakh tons, whereas requirements on the basis of a norm of 17 ozs. per day would come to about 24 lakh tons, leaving a gap of nearly 14.6 lakh tons. The width of this gap is only partially closed by the consumption of tapioca as part of the diet by poorer sections of the people, although it does form an important second line of defence in the lean years as in 1940's when there was a severe food shortage.

1.38 Wide as the food gap in Kerala is, it has often led to the formulation of solutions which, if given effect to, would be retarding the operation of inherent growth factors in the Kerala economy. Every economy may present some "growth leaders", and development consists in stimulating and invigorating them. The climate and physical formation of Kerala favour the growth of a large number of valuable cash crops. It is this sector to which maximum attention should be devoted. Kerala is better suited to serve the role of an exchange economy which relies for its food requirements on the other parts of India and in return contributes to the economic development of the country by earning valuable foreign exchange through the export of raw and semi-processed commodities.

Other Primary Activities

1.39 Of the other three primary activities, viz., animal husbandry, forestry and fisheries, the former, that is, livestock is rather poorly developed. Due to the poor breed, and the natural deficiency in the livestock feed, the cattle is of poor quality with milk yields much lower than the all-India level. The only exception to this is poultry. Kerala can claim to have the best developed commercial poultry in India, the eggs produced in Kerala going even as far north as Punjab. However, in view of under-feeding and the poor conditions under which the birds are reared, there is still a lot of unexploited potential in poultry development.

1.40 Forestry and fishery are the two other sectors which hold an important place in the economy of Kerala. The forests in the State are rich in some of the valuable species like teak and rosewood. As a result of forest management on scientific lines and the high quality of forest growth, their yield per acre in Kerala during 1955-56 was as high as Rs. 18 against the all-India average of Rs. 5.6. This sector is crucial as a source of supply of industrial raw materials.

1.41 Kerala ranks foremost among the fish-producing States of India. In 1957 total fish landings in Kerala were 3.41 lakh tons. With only 10 per cent of the all-

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But much of this increase is the consequence of a greater diversification in agricultural activities with a view to reducing unemployment and under-employment among family labour and raising the family income. Poultry-keeping has, of late, become very popular with the rural families and it is unusual to find families in the rural areas which do not rear at least a few laying birds. Kerala produced 137 million eggs (hen eggs—114 million; duck eggs—23 million) in 1951, and ranked fifth among the States in egg production. Production of eggs is now much higher and may be around 200 million. Kerala is also the biggest exporter of eggs. These are sent as far as Punjab in the north, Calcutta in the east and Bombay in the west and even to foreign countries, mainly Ceylon.

Low Productivity of Livestock

3.5 On an average a cow yields 330 lbs. of milk per year, a buffalo 619 lbs. and a goat 40 lbs. These yield rates compare very unfavourably with those for other parts of India (Table 16).[1] The low productivity of animals is partly due to the poor inherent breed characteristics and partly due to the conditions under which they are reared. The cattle found in Kerala are all of a non-descript type. They are small in size and build. They are stunted in growth. Buffalo in Kerala weighs about half of its counterpart in U.P. or Punjab. The same is true of other livestock too.

3.6 The livestock, especially the bovines, are reared under unwholesome conditions. They are under-fed. The bulk of the ration consists of roughages, mostly rice straw, and is grossly deficient in proteins and other protective properties. The livestock feed available in Kerala is also highly deficient in some of the important bone-building minerals such as calcium and phosphates. This is a direct consequence of a high rainfall which has leached off most of these minerals from the root zones of soils. In the absence of adequate phosphatic and calcium soil amendments, the crops grown in such soils are poor in these minerals. Lack of minerals has a telling effect on the health, build and general condition of the livestock of Kerala. The small size and build are important causes responsible for their low milk yield and poor work output.

3.7 Nutritional deficiencies lead to a number of serious consequences. Poor health results in low vitality and resistance to diseases as well as a low rate of nutritional utilization from feeds. All these factors are responsible for a low level of efficiency and other hazards such as a high rate of mortality and a low rate of fertility. However, realizing the reasons for low productivity, many enlightened farmers have taken to scientific rearing of livestock and have started adding concentrates, such as waste grains, oil cakes and mineral mixtures to the cattle feed. Credit for this goes to the State's Animal Husbandry Department which has been making special efforts to educate the peasantry on the need for adding mineral mixtures to the livestock feed. The Department has been distributing mineral mixtures to farmers at subsidized rates in order to popularize them.

3.8 In view of the very poor quality of livestock in the State there is an urgent need for developing animal husbandry in Kerala. Although animal husbandry

[1] [Table 16, appearing on p. 282 of the text, has not been processed -- Analyst]

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3.13 The Sindhi bulls which have been selected for the upgrading work in Kerala are scarce these days, and it may be difficult to procure the required number for the proposed programme. The number of bulls needed would, however, be much smaller under artificial insemination than under natural service. The former programme should, therefore, be preferred to the latter. As the State is well served with roads and has a good and efficient transport system, three or four central semen collecting centres would be needed to cover the entire State provided the product is quickly dispatched and properly stored while in transit. The centres may be located at Trivandrum, Trichur, Calicut and Palghat. Bulls should be provided for natural service in remote and out of the way places. The proposed breeding programme would need buildings, equipment and livestock for artificial insemination centres. These programmes would require an investment of Rs. 8.76 lakhs over the Third and Fourth Plan periods.

Prevention and Control of Diseases

3.14 Prevention of diseases peculiar to livestock and a machinery for their control is a pre-requisite for proper development of animal husbandry. Under the present circumstances, where there is a heavy incidence of disease and high mortality rates, any enterprise in the field of animal husbandry is fraught with high risks ; and farmers are hesitant to hazard investment on any animal husbandry business. The major share of burden will naturally have to be borne by the Government.

3.15 For effective prevention and control of diseases, it is necessary to have an adequate number of well-staffed veterinary dispensaries and hospitals. These institutions should, as far as possible, render free treatment. Under the conditions prevailing in Kerala, it is considered necessary to have at least two veterinary hospitals in every taluk and one dispensary or first-aid clinic in every Panchayat. Measured by this norm, the existing facilities are utterly inadequate. While there are 55 taluks and 892 Panchayats in Kerala, the total number of hospitals and dispensaries,[1] at the end of 1958-59 were only 45 and 69 respectively. (Table 21)[2]

3.16 Two factors are responsible for this situation : (*i*) shortage of personnel and (*ii*) paucity of funds. With the opening of the veterinary college at Trichur, the situation may be expected to improve with regard to the personnel, provided adequate funds are made available. The State should try to achieve the above norms by the end of the Fourth Plan. Investment on the proposed 20 additional hospitals and 723 dispensaries would be about Rs. 77.3 lakhs.

POULTRY DEVELOPMENT

3.17 Though Kerala has the best developed commercial poultry industry in the country, conditions under which the birds are reared are far from satisfactory. The birds are not adequately fed, and consequently they resort to scavenging. A good

[1] Includes Stockman's stations and Inspector's stations.
[2] In 1960 the numbers were 63 and 133 respectively.

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part of poultry population still consists of the indigenous types despite the introduction of high yielding exotic breeds such as Rhode Island Reds and White Leghorns in the early thirties. The local breeds give 50 to 60 eggs a year, while the average by the White Leghorn and Rhode Island Reds in the Government farm is 186 and 172 eggs respectively.[1] This can convey some idea of the magnitude of unexploited potential in the poultry industry.

3.18 Commercial poultry-rearing as a subsidiary occupation by the farmers has come to be recognized as the quickest and the easiest way of increasing farm incomes and providing employment to the under-employed. In view of these advantages, poultry industry has a special appeal in Kerala. It has been estimated by some experts that through replacement of indigenous birds with the exotic ones, the contribution from this sub-sector to the total State income could be more than doubled. This would be possible in less than five years, provided the pullets of desired types are made available to the farmers in adequate numbers at a low cost. The State should strive to achieve this by opening a large number of poultry extension centres. It is suggested that by the end of 1965-66 there should be at least one poultry extension centre in each Community Development Block. During the Third Plan, 143 additional centres may be opened and all these should work in close association with the block cooperatives. An investment of Rs. 35.75 lakhs would be needed to start the proposed centres.

3.19 Duck-rearing is done only on a small scale in the State in spite of the fact that conditions in most parts of Kerala are very well suited for commercial duck-keeping. Vast inland water resources and the abundant fauna in them is an ideal condition for large scale commercial duck-rearing. There is good demand for duck products particularly in Calcutta and Ceylon but this export potential could be developed only when the fowls are bred in sufficiently large number. It is, therefore, suggested that this potential should be fully exploited and the State should take adequate steps in the matter. In order to make the programme economical, some of the poultry development blocks may include multiplication of suitable duck breeds for distribution. Efforts may be made to select the best from the local birds and rear them for producing pullets for distribution.

Rearing of Goats

3.20 Goat-rearing under stall-fed conditions is customary in Kerala. This is quite contrary to the practice found in other parts of the country, where the goats are let out during the major part of the day for free browsing. Rearing of goats, as it is practised in Kerala, does not lead to dangers such as suppression of vegetation, crop destruction, etc.

3.21 Goats are reared both for milk and meat. The average milk yield per goat is low, 40 lbs. per annum, as against the all-India average of 127 lbs. (Table 16). This is due to poor management and general malnutrition, but could be easily raised to the all-India level with improved feeding and better care. As a matter of fact it is not unusual to find goats yielding as high as 400 to 500 lbs. of milk in urban households and this is due to better management.

[1] *Administration Report of the Animal Husbandry Department, 1957-58, Government of Kerala, 1958.*

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*433 246 3.25 The supply of succulent green fodder throughout the year also needs to be improved. The farmers should be induced to grow leguminous and perennial fodders like elephant and napier grass in the field corners or on waste lands. Distribution of seeds and cuttings to the farmers and demonstration of fodder cultivation on the fields of cultivators would go a long way in improving the production of green fodder. Municipalities and panchayats may also organize fodder farms for utilizing sewage and city compost.

*433 234 3.26 The development measures and aids proposed here, when implemented, would increase the output of animal husbandry products. Proper feeding of cattle and buffaloes can bring about an immediate increase of about 50 per cent in the production of milk.[1] Egg production may increase by over 100 per cent of the present output. Similar increases may be expected in other items too. This would give rise to the problem of suitable utilization of the additional output. Surprisingly enough, even the existing production is not being suitably utilized. For instance, even though milk output in the State is very low and there is an acute scarcity of fluid milk in the urban areas, as much as 41 per cent of the milk is processed into ghee.[2] In a State like Kerala which has a shortage of milk, it would have been more appropriate to consume the maximum possible amount of milk in a fluid state rather than in the form of milk products, since fluid milk is more wholesome and the processing of [442] milk partly destroys its vital nutritional content. This situation is due to lack of purchasing power with the rural people together with absence of facilities to market the milk in the urban areas. Since milk is a highly perishable commodity, the next best course for producers to follow in such a situation is to process it into the comparatively non-perishable ghee. But this is a wasteful process and the profits are also low.

*433 235 442 3.27 It is also gathered that 15 to 25 per cent of the total egg production in the State is wasted by breakage and spoilage due to defective and inadequate marketing facilities. Unless adequate and prompt measures are taken to remove drawbacks in the marketing system, the measures proposed here cannot be expected to yield full benefits and the producers cannot be expected to take a sustained interest in these. The solution to this problem lies in providing at least some of these facilities, the most urgent being the organization of marketing and processing facilities and services for dairy and poultry products.

DAIRY DEVELOPMENT

*433 234 3.28 Dairy development on scientific lines is a pressing need. This was a neglected field prior to the Second Plan. During the Second Plan, however, dairy development received some attention. Two schemes for processing 150 maunds of milk per day, one each in Trivandrum and Calicut, were taken up during the Second Plan. Each

[113] [1] *Third Five Year Plan, Draft Outline*, Government of Kerala, 1960.

[2] In 1956 the total production of milk in Kerala was 4,940 thousand maunds, of this 2,332 thousand maunds (47%) were consumed in the fluid state and 2,020 thousand maunds (41%) converted into ghee.

[113] (Source: *Indian Livestock Statistics, 1953-54* to *1955-56*: Issued by the Economic and Statistical Adviser, Ministry of Food and Agriculture).

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sector. The dairy farms may also take up the manufacture of high value items such as creamery products and *cheddar* cheese.

Processing and Marketing of Poultry Products

3.33 Proper disposal of poultry products is also a pressing need. At present there are a number of private as well as cooperative organizations in the Travancore-Cochin area for collecting and marketing poultry products. Some of them have even inter-State connections. These organizations have rendered satisfactory service to the poultry industry in Kerala. Credit goes to them for having developed export demand for poultry products of the State. All these organizations, however, are faced with serious limitations to further expansion and more efficient working. Their main problem is inadequate working capital. The other difficulties are: (*i*) lack of cold storage facilities, (*ii*) inadequate availability of transport aids and containers for safe transit, and (*iii*) lack of technical guidance. The State should take steps to remove these difficulties. It is suggested that the State should encourage municipalities to construct cold storage godowns. This would benefit not only the poultry industry, but also other activities such as horticulture, meat packing and fisheries. The other needs could be largely looked after by the Development Blocks. It is also suggested that the poultry cooperatives should be asked to grade eggs before marketing them.

3.34 It may not be possible to find market either inside or outside the State for all the marketable surplus in poultry products in the future. This fear is justified in view of the fact that significant development in poultry industry has taken place in some of the egg-importing States such as West Bengal, Madras, Punjab and Bombay under the Second Plan. It may, therefore, be expected that the production of eggs and other items in these States would increase considerably by the end of the Third Plan. Such a development would hit Kerala's exports adversely. In order to guard against such consequences, it is desirable that alternative means of disposal of eggs and poultry meat are planned now. The best method would be to set up a combined egg powder-cum-meat packing plant in a convenient location somewhere in the Travancore-Cochin area. The in take of the plant may be of the order of 30,000 eggs and 500 to 1,000 birds per day. The birds may be processed for preservation and packed in polyethelene bags in convenient numbers. A product like this is bound to be popular all over the country. The plant would need an investment of Rs. 3 lakhs.

3.35 Animal husbandry needs State support and help in other ways too. Loans from the State Government to both processers and cooperatives would be of a great help. The average farmer is at present unable to take to livestock-keeping as a subsidiary occupation on account of lack of funds for investment as well as for working capital. Normal farming agencies like banks and cooperatives do not serve them because of their non-credit worthiness and the uncertain nature of livestock business. Seeking the help of local money-lenders would be too expensive for these ventures. Only the State can solve the problem of rural credit in a situation of this type by making available larger *takavi* funds, arranging for loans through banks and cooperatives, by agreeing to share the risks, etc.

INVESTMENT ESTIMATES

3.36 It is not possible to give the exact extent of investment that would be needed to implement the measures suggested here as the major part of investment would be in the nature of improvement in the rearing conditions, erection of broods, purchase of livestock, poultry, etc., which have to be undertaken by individual farmers themselves. The public sector component of total investment for the programmes suggested in the above pages comes to Rs. 2.7 crores. The major schemes for improvement of cattle, etc., and the likely public sector investment on these is given below :

	Rs. lakhs
Breeding programme	6.76
Veterinary aid	77.90
Poultry Extension Centres	35.75
Dairies (milk-processing units)	145.00
Egg powder factory	3.00
TOTAL	267.81

3.37 Assuming roughly that the proportion between private and public sector investment in the sphere of animal husbandry is the same as in the agricultural sector, private investment by farmers for improvement of livestock and poultry may be taken to be Rs. 3.5 crores. On this basis total investment, therefore, would add up to Rs. 6 crores during the coming decade.

3.38 As a result of the above schemes, it is estimated that milk production e ll go up by approximately 50 per cent while egg production may even double its l f. Output of milk may, therefore, be expected to be 2·73 lakh tons and that of eggs 400 million by 1970-71. NCAER's population projections estimate the population of Kerala in 1970-71 to be 20.12 million. Consumption of milk by the end of the Fourth Plan is, therefore, likely to be about 2 ozs. per head, if the above measures are effectively implemented.

[Text continues on p. 67]

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TABLE 17

GROSS VALUE OF OUTPUT FROM ANIMAL HUSBANDRY IN KERALA

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(Rs. lakhs)

Item	1955-56	1956-57	1957-58
Milk consumed as such	531	540	561
Other milk products	593	604	608
Beef	56	58	62
Buffalo flesh	18	19	20
Mutton	93	97	98
Hides and Skins	29	30	31
Bones and Horns	6	7	7
Eggs	84	121	136
Poultry	72	78	84
Dung	321	381	394
Increment in stock	96	113	116
Miscellaneous	4	4	3
GROSS VALUE OF OUTPUT	*1903*	*2032*	*2180*

SOURCE: *Regional Income of Kerala* (At current prices) 1955-56 to 1957-58: Government of Kerala (1960). [113]

TABLE 18

LIVESTOCK POPULATION OF KERALA—MAJOR CATEGORIES, 1951 AND 1956

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Category	Total		Percentage of increase (+) or decrease (—) in 1956 over 1951
	1951	1956	
Cattle	2,151,522	2,510,376	+ 16.7
Buffaloes	444,368	487,533	+ 9.7
Sheep	423,513	97,820	— 76.9
Goats	423,345	955,570	+ 125.7
Horses and Ponies	518	1,690	+ 226.2
Mules	14	2	— 85.7
Donkeys	689	1,415	+ 105.2
Pigs	117,932	113,711	— 3.6
TOTAL LIVESTOCK	*3,561,901*	*4,168,237*	+ *17.1*
Fowls	3,854,319	6,462,799	+ 67.6
Ducks	263,147	322,085	+ 26.2
Others	..	161	..
TOTAL POULTRY	*4,117,466*	*6,795,045*	+ *65.1*

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SOURCE: *Statistical Outline of Kerala State, 1960.* [113]

[Pp. 280-282 not Processed]